

THE ILLINOIS AND MISSISSIPPI CANAL.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, A REPORT
CONTAINING AN INCREASED ESTIMATE FOR COMPLETING THE
ILLINOIS AND MISSISSIPPI CANAL.

JANUARY 22, 1902.—Referred to the Committee on Rivers and Harbors and ordered
to be printed.

WAR DEPARTMENT,
Washington, January 21, 1902.

SIR: I have the honor to transmit herewith, for the information of the Committee on Rivers and Harbors, a letter from the Chief of Engineers, United States Army, dated January 13, instant, together with a special report from Maj. J. H. Willard, Corps of Engineers, submitting an increased estimate for completing the work of constructing the Illinois and Mississippi Canal, and giving reasons for the necessity for such increase.

Very respectfully,

ELIHU ROOT,
Secretary of War.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, January 13, 1902.

SIR: I have the honor to submit herewith a special report, dated the 6th instant, by Maj. J. H. Willard, Corps of Engineers, submitting an increased estimate for completing the work of constructing the Illinois and Mississippi Canal, and giving the reasons for the necessity for such increase.

The construction of the Illinois and Mississippi Canal was begun in pursuance of the authority of Congress in the river and harbor act of September 19, 1890. The original estimate made in that year for

the completion of the canal was \$6,925,960. Between the years 1890 and 1896 Congress appropriated the sum of \$1,190,000 for continuing work on the project, and under the river and harbor act of June 3, 1896, provision was made for completing the project under the continuing-contract system, the balance of the amount of the original estimate being pledged.

It will be seen from the report of Major Willard that various causes have operated to increase the cost of the work since it was originally planned. The cost of right of way and the expense of constructing bridges have, from causes arising since construction was commenced, greatly exceeded the estimate originally submitted. But the most important reason necessitating an increase in the estimate is the fact that experience has shown that, owing to the unstable conditions of the soil through which the canal route lies, and to provide for the use of the canal by steamboats, it is of importance to protect the banks by revetment from the deteriorating effect of wave action. It is desirable that the canal banks be revetted as the work progresses rather than to defer such work until the canal is put in operation, as originally proposed. It is probable, notwithstanding the unexpected increase in cost of right of way and bridges, that a canal available for canal boats, without bank protection, can be completed within the limit of cost now fixed by law, but it is believed to be the intent of Congress that the work be completed in the most thorough manner.

The increased estimate submitted by Major Willard is:

For right of way and damages.....	\$285,000
For bridges	446,000
For revetment and bank protection.....	1,255,000
Total	1,986,000

As the favorable action of Congress will be necessary before this estimate can be adopted, I have the honor to recommend that the papers be transmitted to the Speaker of the House of Representatives for the information of the Committee on Rivers and Harbors.

Very respectfully, your obedient servant,

G. L. GILLESPIE,
Brig. Gen., Chief of Engineers,
U. S. Army.

Hon. ELIHU ROOT,
Secretary of War.

UNITED STATES ENGINEER OFFICE,
Chicago, Ill., January 6, 1902.

GENERAL: In compliance with your instructions given in the 7th indorsement, dated July 13, 1901, upon my project of April 26, 1901, for expending available funds for constructing the Illinois and Mississippi Canal, I have the honor to make the following report: * * *

In my project of April 26, 1901, I had expressed grave doubts about completing the canal for practical service for the original estimate of \$6,925,960, made in 1890, and stated that the ultimate cost might exceed \$8,500,000. My project, together with detailed reports of construction, was submitted to a Board of Engineers consisting of Lieutenant-Colonel Handbury, Major Townsend, and Captain Warren, who submitted their report July 3, 1901, confirming my statement.

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In a letter of July 1, 1901, submitting the revised estimates to the Board, I stated: "With regard to the estimates, I have to say that if revetment, lining, and strengthening the banks be omitted, I think the work can be finished within the estimate (1890); but as all the items omitted will have to be done both for safety and permanence, the cost will be very much greater in the end, and the service of the canal must be delayed several years thereby."

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The chief item of increased cost is in revetment. After two years' charge of the work and an intimate knowledge of it from frequent personal inspections, I am convinced that this is not only essential, as Major Marshall said, but of vital importance to the safety and protection of the canal banks, and that the work should not be delayed a moment longer than can be avoided. The canal route lies almost wholly in sandy soil, and the deterioration due to storms is already great. Wave wash would intensify the damage. Should the work be postponed until after the canal is opened for traffic, its operation would have to be suspended by drawing down the levels below the footing required for revetment, thus putting the canal out of service for a long period. The work can be done most advantageously, expeditiously, and economically while the present plant, construction track, and rolling stock is available, sidings from the main lines of railways near the canal having been put in by the companies for convenience in delivering material for construction. Postponement would mean that the stone for revetment would have to be hauled in wagons to various points on the canal from the nearest railway stations, the cost of which over the ordinary roads of the country would average at least 20 cents per ton-mile, as determined by the lowest bids for hauling material for masonry constructions on the western section during the past year.

There are other items of increased cost also which could not be foreseen. The changes in location required the summit level to be lowered 9 feet, and also increased the amount of earthwork. This, however, has been compensated for in part by the omission of certain locks and by lower prices than estimated. The right of way and damages have been increased in quantity, and the awards have been very much greater than was anticipated. The latter has been due not only to the decrees of court, but also to the natural development and improvement of the country through which the canal will pass. More highways have been opened, and larger and stronger bridges are required than planned. Since the estimate of 1890 the State of Illinois has increased the loads of highway bridges to 100 pounds per square foot of floor surface, or 20 per cent more than the load formerly accepted as sufficient under the best specifications. The railway bridges have been changed from swing to fixed spans and planned for the heaviest modern engines at high speeds. The dam at Rock Falls for impounding water to feed the canal, instead of being a simple crib, is required by decree of court to be movable to pass floods and to be put down in winter, and therefore may cost several times the original estimate, depending upon the form adopted. The length of the dam will be about 1,300 feet, and the problem is further complicated by the existence of a water privilege below, making the decision as to type one of great delicacy.

Finally, the banks of the canal, which are entirely in fill, should be

strengthened, especially on the feeder, where a break would involve damages to an extent that can not be computed, there being no outlet for overflow between Rock Falls and Green River aqueduct, in a distance of about 24 miles.

This work has been conducted with great care and watchfulness. There has been no extravagance or waste either before or since I took charge of it. Indeed, there have been very great economies throughout, especially in constructions, and that, too, not only without impairing them, but actually increasing their strength and durability. This has been brought about by substituting concrete for stone masonry throughout. The locks, aqueducts, culverts, and bridge abutments are of the first class in all respects, and daily testify the ability and skill of my predecessor. The rest of the canal should be of the same high grade, but it will fall short and be of no permanent value if adequate appropriations are not granted to complete it otherwise than with the limit estimated in 1890, on hasty and imperfect information.

The highway bridge across the Rock River division, known as the Moline bridge, was ordered by Congress to be built out of funds then available for canal purposes, and the case withdrawn from the United States court. The bridge cost \$25,000, which has been charged against the canal appropriation, and is included in the items of excess cost.

In like manner the lock and accessories in the dam across Rock River at the head of the feeder was provided for in the last river and harbor bill without appropriation, although the estimate submitted to Congress was \$75,000 for this additional work. The bill having failed to become a law the estimate is not repeated, but if the work should be authorized anew, which is not unlikely, since it is meritorious, the amount of the estimate should be provided in addition to the amount given herein.

When the estimates were prepared for the Board of Engineers, work was being pushed rapidly on a large scale, and only a limited time was allowed to get the information necessary for an accurate statement of the cost of the work done and remaining to be done. Since then the estimates have been revised with thorough care, and it is believed that nothing has been overlooked.

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The fears expressed in my project of April 26, that the canal would cost more than \$8,500,000, have been confirmed by the latest careful revision, now submitted, which makes the excess \$1,985,591.72, and although the same efforts for economies will be made in the future as in the past, it will not be safe to discount this amount since there is so much less work remaining to be done. Balancing off the savings and the excesses of cost, the principle items of increase, which were unforeseen when the preliminary estimate of 1890 was submitted, and which were beyond the power of the Department to regulate, are, in round numbers:

For right of way and damages.....	\$285, 000
For bridges	446, 000
For revetment and bank protection.....	1, 255, 000
Total.....	1, 986, 000

The estimates are given in detail for the separate divisions of the canal in the reports^a of the assistant engineers herewith, but they are summed up here for convenience:

^aNot printed.

	1890.	1901.	Excess.
Eastern section.....	\$2,948,917.40	\$3,688,832.70	\$739,915.30
Western section.....	1,563,618.10	2,527,768.32	964,150.22
Feeder.....	1,858,398.00	2,062,755.96	204,357.96
Rock River division.....	62,524.00	84,964.21	22,440.21
Rock Rapids division.....	492,501.90	*647,229.93	54,728.03
Total.....	6,925,959.40	8,911,551.12	1,985,591.72

* Put in operation April 17, 1895.

Estimate 1901..... \$8,911,551.12
Amount appropriated to March 3, 1901..... 6,213,526.46

Amount required to be appropriated to complete the canal.... 2,698,024.66

Very respectfully, your obedient servant,

J. H. WILLARD,
Major, Corps of Engineers.

Brig. Gen. G. L. GILLESPIE,
Chief of Engineers, U. S. A.

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